

WHAT IS CLAIMED

1. A method for transmitting information in an optical communication system, comprising:

transmitting an optical information signal at a wavelength over an optical link
5 with a first and a second end;

pre-distorting for dispersion the optical information signal proximate the first end of the optical link; and

compensating the optical information signal proximate the second end of the optical link for dispersion, wherein the pre-distortion and the compensation have
10 opposite polarity at the transmitting wavelength.

2. The method of Claim 1, wherein pre-distorting for dispersion occurs at a node in a first office including a transmitter.

15 3. The method of Claim 1, wherein compensating the optical signal occurs at a node in a second office including a receiver.

4. The method of Claim 1, further comprising amplifying the optical signal in-line without dispersion compensating modules.
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5. The method of Claim 1, further comprising amplifying the optical signal in-line at several point without dispersion compensating modules.

6. The method of Claim 1, further comprising amplifying the optical
25 signal in-line over a substantial length of the optical link between a transmitter and a receiver without dispersion compensating modules.

7. The method of Claim 1, further comprising amplifying the optical
30 signal proximate the first end of the optical link in connection with pre-distorting for dispersion.

8. The method of Claim 5, wherein the optical information signal is amplified proximate the first end of the optical link by an erbium-doped fiber amplifier.

5 9. The method of Claim 1, wherein the optical information signal is pre-distorted for dispersion by a dispersion compensating module having a same polarity as the optical link.

10 10. The method of Claim 1, wherein the optical information is signal is transmitted over a 200 kilometer section of the optical link without transmitting over a dispersion compensating module.

15 11. The method of Claim 1, wherein the optical information is signal is transmitted over a 500 kilometer section of the optical link without transmitting over a dispersion compensating module.

20 12. The method of Claim 1, wherein the optical information is signal is transmitted over a 1000 kilometer section of the optical link without transmitting over a dispersion compensating module.

13. The method of Claim 1, wherein the optical information signal has a bit rate of 40 Gb/s or above.

25 14. The method of Claim 1, wherein the optical information signal is compensated proximate the second end of the optical link for dispersion by a dispersion compensating module.

30 15. The method of Claim 1, further comprising amplifying the signal proximate the second end of the optical link in connection with compensating the optical signal.

16. The method of Claim 15, wherein the optical information signal is amplified by a distributed Raman amplifier (DRA).

17. The method of Claim 15, wherein the optical information signal is
5 amplified by an erbium-doped fiber amplifier.

18. The method of Claim 14, wherein the dispersion compensation module comprises at least one Raman amplified dispersion compensating fiber (DCFRA).

10 19. The method of Claim 1, wherein the optical information signal is compensated proximate the second end of the optical link for dispersion by two or more amplifiers with two or more dispersion compensating modules.

20. An optical communication system, comprising:
means for transmitting an optical information signal at a wavelength over an optical link with a first end and a second end;
means for pre-distorting for dispersion the optical information signal proximate the first end of the optical link; and
5 means for compensating for dispersion the optical information signal proximate the second end of the optical link, wherein the pre-distortion and the compensation have opposite polarity at the transmitting wavelength.
- 10 21. The system of Claim 20, further comprising means for amplifying the optical signal in-line without dispersion compensating modules.
22. The system of Claim 20, further comprising means for amplifying the optical signal in-line at several point without dispersion compensating modules.
- 15 23. The system of Claim 20, further comprising means for amplifying the optical signal in-line over a substantial length of the optical link between a transmitter and a receiver without dispersion compensating modules.
- 20 24. The system of Claim 20, further comprising means for amplifying the optical signal proximate the first end of the optical link in connection with the means for pre-distorting for dispersion.

25. A optical communication system, comprising:
an optical link with a first end and a second end;
a first dispersion device proximate the first end of the optical link configured
to pre-distort for dispersion optical information signals transmitted over the optical
5 link coupled to the optical link; and

a second dispersion device proximate the second end of the optical link
configured to compensate for dispersion optical information signals and coupled to
the optical link, wherein the first and second dispersion devices have opposite
polarities of dispersion.

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26. The system of Claim 25, wherein the first dispersion device is located
at a node in a first office including a transmitter.

27. The system of Claim 26, wherein the transmitter comprises one or
15 more optical transmitters coupled to a wavelength division multiplexed multiplexer.

28. The system of Claim 25, wherein the second dispersion device is
located at a node in a second office including a receiver.

29. The system of Claim 28, wherein the receiver comprises a wavelength
20 division multiplexed demultiplexer coupled to one or more optical receivers.

30. The system of Claim 29, further comprising one or more variable
dispersion compensators coupled to the one or more optical receivers at the second
25 end of the optical link.

31. The system of Claim 25, further comprising one in-line amplifiers
without dispersion compensating modules coupled to the optical link.

32. The system of Claim 25, further comprising several in-line amplifiers
30 with dispersion compensating modules coupled to the optical link.

33. The system of Claim 25, further comprising several in-line amplifiers with dispersion compensating modules interposed along a substantial length of the optical link between a transmitter and a receiver.

5 34. The system of Claim 25, wherein an optical information signal is transmitted over a 200 kilometer section of the optical link without transmitting over a dispersion compensating module.

10 35. The system of Claim 25, wherein an optical information signal is transmitted over a 500 kilometer section of the optical link without transmitting over a dispersion compensating module.

15 36. The system of Claim 25, wherein an optical information signal is transmitted over a 1000 kilometer section of the optical link without transmitting over a dispersion compensating module.

20 37. The system of Claim 25, wherein the first dispersion device proximate the first end of the optical link configured to pre-distort for dispersion optical information signals transmitted over the optical link is a optical fiber with a same polarity as the optical link at a transmitted wavelength.

 38. The system of Claim 25, further comprises a first amplifier proximate the first end of the optical link in connection with the first dispersion device.

25 39. The system of Claim 38, wherein the first amplifier is an erbium-doped fiber amplifier.

 40. The system of Claim 38, wherein the first amplifier is a distributed Raman amplifier (DRA).

30 41. The system of Claim 25, wherein the second dispersion device proximate the second end of the optical link configured to compensate for dispersion

optical information signals is a dispersion compensating module with a polarity opposite the optical link.

42. The system of Claim 25, further comprising a second amplifier
5 proximate the second end of the optical link in connection with the second dispersion device.

43. The system of Claim 42, wherein the amplifier is a distributed Raman
10 amplifier.

44. The system of Claim 42, wherein the amplifier is an erbium-doped
fiber amplifier.

45. The system of Claim 41, wherein the dispersion compensating module
15 comprises Raman amplified dispersion compensating fiber (DCFRA).

46. The system of Claim 25, further comprising a plurality of second
amplifiers with a plurality of dispersion compensators proximate the second end of
the optical link configured to compensate for dispersion optical information signals.

20 47. The system of Claim 25, further comprising a plurality of first
amplifiers with a plurality of dispersion compensators proximate the first end of the
optical link configured to pre-distort for dispersion optical information signals.

48. An optical communication system, comprising:
- a transmitter operable to multiplex a plurality of optical information signals and generate wavelength division multiplexed (WDM) signals;
 - an optical link operable to transmit the WDM signals, wherein the transmitter
5 is coupled to one end of the optical link and a receiver is coupled to the other end;
 - a first dispersion device fiber with a polarity the same as the optical link operable to pre-distort for dispersion the WDM signal and coupled to the optical link proximate the transmitter;
 - a plurality of in-line amplifiers without dispersion compensating modules
10 coupled to the optical link;
 - a second dispersion device with a polarity opposite the optical link operable to compensate for dispersion the WDM signals and coupled to the optical link proximate the receiver; and
 - the receiver operable to demultiplex the WDM signals.